UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,419	07/11/2003	David John Hillis	MRKS/0122	7081

7590 04/25/2008

WILLIAM B. PATTERSON
MOSER, PATTERSON & SHERIDAN, L.L.P.
Suite 1500
3040 Post Oak Blvd.
Houston, TX 77056

EXAMINER	
HUGHES, SCOTT A	
ART UNIT	PAPER NUMBER
3663	
MAIL DATE	DELIVERY MODE
04/25/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/618,419	HILLIS ET AL.	
	Examiner	Art Unit	
	SCOTT A. HUGHES	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29 and 54-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29,54-57* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 2/5/2008 have been fully considered but they are not persuasive.

Applicant argues that the grooves in the Peterson reference do not increase collapse resistance. Applicant argues that, to the contrary, the grooves are to facilitate collapse without unacceptable radial deformation in the presence of axial load. This argument is not persuasive because Peterson specifically states that the grooves increase the overall collapse resistance of the tubing when they collapse to tear drop shapes in the presence of axial load, thereby shortening the overall length of the pipe (See Peterson, Column 2, Column 4, Lines 1-24; Column 6, Lines 1-10). Although the grooves facilitate collapse as stated by applicant, this collapse is a controlled, limited collapse to tear drop shape that increases the overall collapse resistance of the entire tubing. Because the overall collapse resistance of the tubular is increased by the addition the grooves, Peterson increases the collapse resistance of the tubular.

Applicant argues that Harrall does not provide any indication or reasoning for cone swage expansion of the same tubular that is in direct engagement with a rotary expansion tool. This argument is not persuasive because Harrall teaches that tubulars can be expanded using both swage expanders and rotary expanders. Harrall teaches that using rotary expansion has benefits over swage expansion in terms of collapse resistance. Therefore, it would be obvious to modify a well previously enlarged with a cone swage expander by locating a rotary tool having a bearing member (rotary tool) in

the tubular, and using this tool to expand the tubular in order to strengthen worn casing and to increase the collapse resistance of the tubulars as taught by Harrall.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-19, 23-29, 54-55, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson (WO0037766) in view of Peterson (5275240).

With regard to claim 1, Simpson discloses a method of increasing collapse resistance of a tubular (abstract). Simpson discloses locating a tool 100 having at least one bearing member 116 within the tubular (Figs. 1-3, 11a-16b) (Pages 14-17). Simpson discloses placing the bearing member in engagement with a wall of the tubular to apply a radial force to a discrete zone of the wall (Figs. 5a-8b) (Pages 15-18). Simpson discloses applying the radial force to further discrete zones of the wall (Figs. 5a-8b) (Pages 15-18). Simpson discloses selecting a level of the radial force (Figs. 5a-10b) (Pages 15-20). Simpson does not disclose that the radial force increases the collapse resistance of the tubular independent of any constraining effects on the tubular. Simpson does disclose that the rollers plastically deform the tubular by expansion. Peterson teaches that the collapse resistance of a tubular can be increased by adding grooves to the interior surface of the tubular, and this collapse resistance is independent

of any constraining effects on the tubular (abstract; Column 2, Lines 1-44; Column 3, Line 1 to Column 4, Line 24; Column 6, Lines 1-10). It would have been obvious to modify Simpson to include using the axial forces from the rollers to create grooves in the inner surface in order to prevent casing damage if there is compaction of the surrounding formation.

With regard to claim 2, Simpson discloses that applying the radial force induces compressive yield of at least an inner portion of the wall due to selecting the level of the radial force sufficient to cause the compressive yield (Figs. 5a-10b) (Pages 15-20).

With regard to claim 3, Simpson discloses that applying the radial force induces plastic deformation of at least an inner portion of the wall due to selecting the level of radial force sufficient to cause the plastic deformation (Figs. 5a-10b) (Pages 15-20).

With regard to claim 4, Simpson discloses that the bearing member is a rolling element and the tool is moved relative to the tubular to provide a rolling contact between the rolling element and the tubular wall (Figs. 1-3, 6, 24, 28a-30) (Pages 15-19).

With regard to claim 5, Simpson discloses moving the tool relative to the tubular to provide a sliding contact between the bearing member and the tubular wall (Figs. 1-3, 6, 24, 28a-30) (Pages 15-19, 34-38).

With regard to claim 6, Simpson discloses that the tool is advanced axially relative to the tubular (Figs. 1-3, 6, 24, 28a-30) (Pages 15-19, 34-38).

With regard to claim 7, Simpson discloses that the tool is located relative to the tubular about a longitudinal axis of the tubular (Figs. 1-3, 6, 24, 28a-30) (Pages 15-19, 34-38).

With regard to claim 8, Simpson discloses that the tool is located within the tubular (Figs. 1-6, 24, 28a-30)

With regard to claim 9, Simpson discloses that applying the radial force causes a degree of diametric expansion of the tubular (Figs. 1-3, 6, 24, 28a-30) (Pages 15-19, 34-38).

With regard to claim 10, Simpson discloses that applying the radial force causes a permanent diametric expansion of the tubular (Figs. 1-3, 6, 24, 28a-30) (Pages 15-19, 34-38).

With regard to claim 11, Simpson discloses that the tubular experiences little or no diametric expansion (Figs. 1-3, 6, 24, 16a-30) (Pages 15-19, 34-38). As seen in the figures, there is little expansion of the diameter.

With regard to claim 12, Simpson discloses that the tool is moved relative to the tubular such that the bearing member describes a helical path along the tubular wall (Figs. 1-3, 6, 24, 28a-30) (Pages 15-19, 29, 34-38). Simpson discloses that the tool rotates as it moves in the tubular. This rotation and movement downward or upward describes a helical path.

With regard to claim 13, Simpson discloses that the tool has a plurality of bearing members, and each bearing member is urged into engagement with the wall of the tubular to impart a radial force to a respective discrete zone of the tubular wall (Figs. 1-6) (Pages 15-20)

With regard to claim 14, Simpson discloses that the respective discrete zones are circumferentially spaced relative to one another (Figs. 1-6).

With regard to claim 15, Simpson discloses that the respective discrete zones are axially spaced relative to one another (Figs. 1-6) (Pages 15-20). Simpson discloses moving the tool up or down the borehole, and therefore the expanded zones are axial spaced as the tool expands different sections of the tubular as it moves up or down.

With regard to claim 16, Simpson discloses that the bearing member applies the radial force to the tubular wall as a point load (Figs. 1-6).

With regard to claim 17, Simpson discloses that the bearing member applies the radial force to the tubular wall as a line load (Figs. 1-6).

With regard to claim 18, Simpson discloses that the bearing member is fluid pressure actuated (Pages 1-10, 14-15).

With regard to claim 19, Simpson discloses that the tool comprises a plurality of bearing members and at least one of the bearing members is independently radially moveable (Pages 1-10, 14-19).

With regard to claim 23, Peterson teaches that deformations to the tubular can be done on the surface to increase the collapse resistance before the tubular is placed in a wellbore (Columns 1-4).

With regard to claim 24, Simpson discloses locating the tubular in a wellbore drilled to access hydrocarbon reservoirs, wherein steps a) to c) are executed downhole within the wellbore (Pages 1-10).

With regard to claim 25, Simpson discloses that the tubular is located within a larger tubular (Pages 18-24).

With regard to claim 26, Simpson discloses that the larger diameter tubular is unexpandable (Page 18, Lines 19-29).

With regard to claim 27, Simpson discloses that the tool creates a strain path in the wall of the tubular having a circumferential element (Pages 1-10, 15-20).

With regard to claim 28, Simpson discloses that the tool creates a circumferential strain path (Pages 1-10, 15-20).

With regard to claim 29, Simpson discloses that the tool creates a helical strain path (Pages 15-19, 29, 34-38).

With regard to claim 54, Simpson discloses a method of increasing collapse resistance of a tubular (abstract). Simpson discloses locating a tool 100 having at least one bearing member 116 within the tubular (Figs. 1-3, 11a-16b) (Pages 14-17). Simpson discloses placing the bearing member in engagement with a wall of the tubular to apply a radial force to a discrete zone of the wall (Figs. 5a-8b) (Pages 15-18). Simpson discloses applying the radial force to further discrete zones of the wall (Figs. 5a-8b) (Pages 15-18). Simpson discloses selecting a level of the radial force (Figs. 5a-10b) (Pages 15-20). Simpson does not disclose that the radial force increases the collapse resistance of the wherein the tubular experiences no diametric expansion as a result of the radial force applied. Simpson does disclose that the rollers plastically deform the tubular by expansion. Peterson teaches that the collapse resistance of a tubular can be increased by adding grooves to the interior surface of the tubular, and this collapse resistance is accomplished with any diametric expansion (abstract; Column 2, Lines 1-44; Column 3, Line 1 to Column 4, Line 24; Column 6, Lines 1-10). It

would have been obvious to modify Simpson to include using the axial forces from the rollers to create grooves in the inner surface in order to prevent casing damage if there is compaction of the surrounding formation.

With regard to claim 55, Peterson teaches that an outer diameter of the tubular experiences no diametric expansion, and therefore it would be obvious that using the rollers of Simpson to create the grooves in the inner surface would not increase diameter as a result of the radial force applied by the bearing member (abstract; Column 2, Lines 1-44; Column 3, Line 1 to Column 4, Line 24).

With regard to claim 57, Simpson discloses constraining an outer diameter of the tubular prior to applying force (Pages 18, 30-38)

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson in view of Peterson as applied to claim 1 above, and further in view of Hempel (2898971).

With regard to claim 20, Simpson does not disclose that the tool comprises a ball-peening tool and is impacted against the inner surface of the wall. Hempel teaches using a roller expanding tool for expanding tubulars and teaches that the tool comprises a ball-peening tool (Columns 3-5). It would have been obvious to modify Simpson to include a ball-peening tool as taught by Hempel in order to join inner and outer tubulars.

Claims 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson in view of Peterson as applied to claim 1 above, and further in view of Harrall (SPE 2002).

With regard to claim 21, Simpson does not disclose that the tubular has been previously expanded by a cone swage expander. Harrall teaches that rotary expansion tools can be used in previously formed wells (Page 4). Harrall teaches that the method used to create most previously formed wells was to expand the tubulars with cone swages (Pages 1-2). It would have been obvious to modify Simpson to use the tool having the bearing members on wells that were previously formed with cone swage expanders as taught by Harrall in order to strengthen worn casing.

With regard to claim 22, Harrall discloses expanding the tubular with a cone swage expander prior to steps b) and c) (Pages 1-2) (previously formed wellbores).

Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson in view of Harrall (SPE 2002).

With regard to claim 56, Simpson discloses a method of increasing collapse resistance of a tubular (abstract). Simpson discloses locating a tool 100 having at least one bearing member 116 within the tubular (Figs. 1-3, 11a-16b) (Pages 14-17). Simpson discloses placing the bearing member in direct engagement with a wall of the tubular to apply a radial force to a discrete zone of the wall (Figs. 5a-8b) (Pages 15-18). Simpson discloses applying the radial force to further discrete zones of the wall (Figs. 5a-8b) (Pages 15-18). Simpson discloses selecting a level of the radial force to

increase collapse resistance of the tubular (Figs. 5a-10b) (Pages 15-20). The force selected by Simpson deforms the inner tubular into permanent contact with an outer tubular, thereby enjoining the two and increasing collapse resistance. Simpson does not disclose expanding the tubular with a cone expander before locating the tool in the tubular. Harrall teaches that rotary expansion tools can be used in previously formed wells (wells formed before the rotary expansion tool is located in the well), and that these tools increase the collapse resistance of the tubular (Page 4). Harrall teaches that the method used to create most previously formed wells was to expand the tubulars with cone swages (Pages 1-3). It would have been obvious to modify Simpson to use the tool having the bearing members on wells that were previously formed with cone swage expanders as taught by Harrall in order to strengthen worn casing.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SCOTT A. HUGHES whose telephone number is (571)272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. A. H./
Examiner, Art Unit 3663

/Jack W. Keith/

Supervisory Patent Examiner, Art Unit 3663